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Intellectual Property Department
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EXAMINER	
THOMAS, MIA M	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/598,448	POTKE, MARCO	
	Examiner	Art Unit	
	Mia M. Thomas	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 October 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,14 and 15* is/are rejected.

7)☒ Claim(s) *4,6-13,16 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to applicant's remarks received on 25 October 2010. Claims 1-17 are pending in the application. Various claims are amended to conform to U.S. practice. Only claims 1-5, 14 and 15 will be treated on the merits. (SEE Arguments below as Claims 6-13, 16 and 17 are not) A complete response to applicant's remarks follows here below.

Response to Arguments

2. Applicant's arguments filed 25 October 2010 have been fully considered but they **are not** persuasive. With respect to Section I. Claim Objections, claims 6-13 and 16-17 do not conform to U.S. practice in that claims 6-13 and 16-17 are in improper form. See MPEP § 608.01(n). Accordingly, Claims 6-13, 16-17 **will not** be further treated on the merits. Appropriate correction is required.

3. Applicant's arguments, see page 7, filed 25 October 2010, with respect to Claim Rejections - 35 USC § 101 have been fully considered and are persuasive. The rejection of claim 16 has been **withdrawn**.

4. Applicant's arguments, see page 8, filed 25 October 2010, with respect to Claim Rejections - 35 USC § 112, first paragraph have been fully considered and are persuasive. In view of the amendments to further correction/clarify the argument with respect to 35 U.S.C. 112, first paragraph, the rejection of claim 17 has been **withdrawn**.

5. Applicant's arguments, see page 9, filed 25 October 2010, with respect to Claim Rejections - 35 USC § 112, second paragraph have been fully considered and are persuasive. The rejection of claims 1, 5, 14 and 15 has been **withdrawn**.

6. Applicant's arguments filed 25 October 2010have been fully considered but they **are not** persuasive. Regarding Section V. Claim Rejections under 35 U.S.C. 103 **are not persuasive**. For example, at page 11, the applicant alleges that Kriegel does not teach the significant limitations as required by claim 1 and similarly by claim 5 wherein, “determining feature data for the object on the basis of at least one property of the respective portions of the object that at contained in the plurality of cells. Nothing in Kriegel discusses “property of the respective portions of the object.”

The Examiner respectively disagrees. At least at the abstract of Kriegel, Kriegel teaches "we explain how sets of feature vectors can be used for more effective and still efficient similarity search[es]." From this description, the ordinary skilled artisan would understand that the objects for consideration of image analysis with respect to "molecular biology and medical imaging" each of which could process similarities queries (searches) on a cell or plurality of cells, that the determination of feature data would be derived from a plurality of cells.

The ordinary skilled artisan could have also easily analyzed and looked to the Kriegel reference to teach feature data that was based on the properties of portions of an object.

Notwithstanding, Kriegel at page 587, Section 1, right column, paragraph one, also teaches, "this invention is based on mapping an object onto a set of feature vectors, i.e. an object is described in a point set." By definition, “AutoCAD 2011 Help Dictionary” says that a point set or point objects *"can be useful, for example, as node or reference points that you can snap to and offset objects from. You can set the style of the point and its size relative to the screen or in absolute units."* Further, Kriegel also teaches at Section 4, “Using Sets of Feature Vectors For

Similarity Queries" "Figure 4, displays a 2-d example of a comparison between a query object and a very similar database object." It is understood in the feature extraction, pattern recognition application of image processing that in order to compare an "object" said object must have some type of property or geometry with which to associate the property to describe the features of the object. As taught at JavaScript Mapping Library "Vector features use the OpenLayers.Geometry classes as geometry description. They have an 'attributes' property, which is the data object, and a 'style' property, the default values of which are defined in the OpenLayers.Feature.Vector.style objects."

At least for the reasons listed above and in support of the definitions of the supporting dictionaries, the Examiner maintains that Kriegel more than fairly suggests "determining the feature data for the object on the basis of at least one property of the respective portions of the object that are contained in the plurality of cells."

With respect to the Domanik reference, the applicant's allege that [Domanik] This has nothing at all to do with the techniques disclosed by Kriegel with regard to using sets of feature vectors for similarity search on voxelized CAD objects. Domanik does not discuss voxels, and has no application to CAD systems or objects. These are disparate, non-analogous references.

The Examiner respectfully disagrees.

Kriegel and Domanik are combinable because they are in the same field of image processing with respect to image processing applications in relation to biomedical applications and more specifically, cell analysis, classification and counting.

In response to applicant's argument that Domanik is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Domanik teaches image processing biomedical analysis on cells, cytological specimen as shown at the abstract and title of the invention.

The cytological analyzer of Domanik "includes a means which is responsive to an image of a portion of a cytological specimen, for determining if the portion contains viewable specimen material. A means which is responsive to the image containing viewable specimen material stores *coordinates* indicative of the location of the image on the cytological specimen. A means which is responsive to a plurality of the stored coordinates, each indicative of a location on the cytological specimen for a corresponding image, generates a routing path which minimizes the time required for a viewer of the cytological specimen to view each of the images which contain a viewable portion of a specimen."

The Examiner looked to Domanik, as stated below in the 35 U.S.C. 103 rejection to teach "at least two of the plurality of cells overlap each other at least in part." The combination of the teachings of Kriegel and Domanik more than fairly teach all the claimed elements as rejected below at claims 1 and 5.

A person of ordinary skill in the art could have looked to the invention of Domanik to teach "overlapping cells" when determining feature data, in this case, the cytological specimen as taught in Domanik. Domanik also teaches "the path between the views to be presented is

optimized, thus further *reducing the amount of time required* to view the cytological material on the slide. The efficiency of the analysis is thus increased and operator fatigue is decreased by increasing the proportion of time spent by the operator on analysis of actual cytological material."

The skilled artisan could look to an image processing biomedical cell analysis system such as Domanik to further reduce the amount of time required and to increase efficiency of determining feature data. Further, "Systems operating in accordance with the present invention can thus accommodate a wide range of sample types and preparations while computerized image analysis systems programmed to detect certain abnormalities can accommodate only those specific types and preparations of specimens for which they are programmed." (at column 2, lines 34+, Domanik).

At least for the reasons listed above, applicant's arguments as presented **are not** persuasive and the Examiner maintains that Kriegel in combination with Domanik teaches all the claimed elements as rejected below.

With respect to applicant's arguments with respect to Luo, and Hancock, the arguments are also **not** persuasive and the claim rejections are also maintained. Specifically, the applicant states that "Hancock is non analogous art and does not cure the deficiencies of the Kreigel/Domanik combination. It appears these disperate references were simply cited because they reference grids, with no concern for whether they are actually related at all fo the CAD processes as claimed." The Examiner wishes to note that the CAD processes as claimed are generic wherein the feature data of the claimed invention is not drawn to any particular nature of "feature data" and the "object" of the claims are not particular nor specific. It is important to

conclude that "the claims are interpreted in light of the specification, limitations from the specification are not read into the claims." See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument that Domanik, Luo and Hancock are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Kriegel and Domanik are combinable because they are in the same field of image processing with respect to image processing applications in relation to biomedical applications and more specifically, cell analysis, classification and counting. Hancock is *expressly* relied upon for general claim language of Claim 3. Kriegel, Domanik and Hancock are combinable because they are in the same field of image processing and analysis and classification of feature data.

Although, Hancock does not expressly teach objects pertaining to molecular biology or medical imaging, it is noted that Hancock teaches *computer aided design* of nested grid structures of cells.

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re*

Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, The teachings of Hancock are used to expressly identify that computer aided design also achieves the same predictable results of "subdividing a cell corresponding to the data into as many levels of hierarchically arranged sub-cells as necessary to obtain a desired precision" (at paragraph [0009], Hancock).

7. At least for the reasons listed above, applicant's arguments as presented **are not** persuasive.

Claim Objections

8. Claims 6-13 and 16-17 are objected to under 37 CFR 1.75(c) as being in improper form. See MPEP § 608.01(n). Accordingly, Claims 6-13 and 16-17 will not be further treated on the merits. **Appropriate correction is required**.

Claims 1-5, 14 and 15 are the only claims in proper form for examination on the merits.

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 1, 2, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kriegel et al. "Using Sets of Feature Vectors for Similarity Search on Voxelized CAD Objects" SIGMOD 2003, June 9-12 (ACM), pages 587-598 (1-12) in combination with Domanik et al. (US 6091842 A).

Regarding Claim 1 (Currently Amended): Kriegel teaches a method for determining feature data ("Based on the most promising of these three models, we explain how sets of feature vectors can be used for more effective and still efficient similarity search." at abstract) that represents information about the shape of an object , the object being located in a k-dimensional space ("Examples for new applications that require the retrieval of similar 3-D objects include databases for molecular biology, medical imaging and computer aided design." at page 1(587), Section 1. Introduction, left column) the method comprising the steps of:

determining a partitioning scheme that defines a plurality of cells in the space in which the object is located such that at least some of the cells each contain a respective portion of the object (Refer to Figure 1, further at Sections 1.1 Shape Histograms and Section 3.3 Spatial Features; "We divide the data space into axis parallel, equi-sized partitions (cf. Figure 1). This kind of space partitioning is especially suitable for voxelized data, as cells and voxels are of the same shape, i.e. cells can be regarded as coarse voxels.")

and determining the feature data for the object ("After partitioning the data space, we have to determine the spatial features of the objects for each grid cell depending on the chosen model." at page 588, Section 3.3 Spatial Features) on the basis of at least one property of the respective portions of the object that are contained in the plurality of cells (Refer to Figure 4, Section 4, Using Sets of Feature Vectors for Similarity Queries);

Domanik teaches at least two of the plurality of cells overlap each other at least in part ("Preferably, tiles are positioned so that the viewable material is positioned at the center of the tile. As seen in FIG. 1, tiles may be separate to cover viewable material which can be covered

by a single tile. Tiles may also overlap one another (as seen in FIG. 1) to cover viewable material which requires multiple tiles to cover the material." at column 10, lines 8-28).

Kriegel teaches determination by a computer for determining feature data that represents information about the shape of an object. Kriegel teaches "an application that is applicable to computer aided applications for suitably processing similarity models to reduce the cost of developing and producing new parts by maximizing the reuse of existing parts." (at abstract, Kriegel). It is implied that to execute the "similarity search" as taught in Kriegel that one of ordinary skill in the art must use a computer or specific machine (Refer to Section 5.4, right column, paragraph two) "Our test machine was equipped with an INTELXEON 1.7GHz processor and 2GByte main memory."

Kriegel and Domanik are combinable because they are in the same field of image processing and cell analysis and classification of feature data.

It would have been obvious for at least two of the plurality of cells to overlap each other, at least in part as taught by Domanik.

The suggestion/motivation for combining Kriegel and Domanik would have been at least "improve[ed] cytological screening efficiency by varying amounts, and also reduce[ing] the time required to accurately analyze a cytological specimen and thereby increase the efficiency by which such a specimen may be analyzed." (Domanik, column 1, lines 46+).

All of the claimed elements were known in the prior art at the time that the invention was made.

It would have been obvious to the skilled artisan to be able to combine the teachings of Kriegel and Domanik by known methods with no change in their respective functions, and the combination of the teachings would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Therefore, it would have been obvious to combine the teachings of Kriegel and Domanik to obtain the specified claimed elements of Claim 1.

Regarding Claim 2: (As best understood by the Examiner) Domanik teaches the plurality of cells comprises at least a first and a second group of cells such that the union of the cells in the first group of cells coincides with the union of the cells in the second group of cells wherein each cell of the first group of cells overlaps at least in part with at least one respective cell of the second group of cells (Refer to Figure 1, numeral 102; "Image capture of a specimen 103 on the slide 102 is performed by subdividing the slide 102 into a plurality of equally sized regions, designated by the dotted lines in the slide 102, and individually capturing a digital image of a region.")

Note: As shown at Figure 1, the Examiner is points to numeral 106 to teach that the cells have been divided into groups of cells as shown at numeral 102. It is also shown at least at numeral 102 that the groups of cells overlap.

Regarding Claim 14: (Currently Amended) Kriegel teaches ~~Use of a~~ the method ~~according to one of claims 1 to 13 for performing a similarity *search* between~~ claim 1, wherein the determining steps are performed first for a first object and then also performed for a set of

second ~~objects, wherein~~ to determine feature data for the first object and for each of the set of second objects ~~is determined according to the method according to one of claims 1 to 13, and wherein the~~ and further comprising performing a similarity search ~~is performed~~ between the first object and the set of second objects based on ~~the basis~~ of a comparison of the determined feature data ("The experimental evaluation is based on two real world test data sets and points out that our new similarity approach yields more meaningful results in comparatively short time." at abstract).

Regarding Claim 15: (Currently Amended) Kriegel teaches ~~Use of a~~ the method according ~~to one of claims 1 to 13 for performing a similarity classification of a set~~ of objects, claim 1. wherein the determining steps are performed to determine feature data for each object of a set of objects ~~is determined according to the method according to one of claims 1 to 13,~~ and wherein the objects of the set of objects are grouped according to their respective similarities on the basis of a classification of the determined feature data ("In this paper, we introduce an effective and flexible similarity model for complex 3-D CAD data, which helps to find and group similar parts.").

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kriegel et al. in combination with Domanik et al, and further in view of Hancock (US 20030036842 A1).

Regarding Claim 3: (Currently Amended) Kriegel and Domanik in combination teach all the claimed elements as rejected above.

Kriegel and Domanik in combination do not expressly recite nested cells.

Hancock expressly teaches at least a group of nested cells wherein all cells of the group of nested cells are nested within each other ("At least some of the plurality of cells of the one or more local city grids directly overlap and coincide with at least some of the plurality of cells of the one or more regional grids to form a nested grid structure." at abstract, paragraphs [0007, 0008]).

Kriegel, Domanik and Hancock are combinable because they are in the same field of image processing and analysis and classification of feature data.

Hancock does not expressly teach objects pertaining to molecular biology or medical imaging.

However, Hancock teaches *computer aided design* of nested grid structures of cells.

The teachings of Hancock are used to expressly identify that computer aided design also achieves the same predictable results of "subdividing a cell corresponding to the data into as many levels of hierarchically arranged sub-cells as necessary to obtain a desired precision" (at paragraph [0009], Hancock).

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Kriegel, Domanik and Hancock to obtain the specified claimed elements of Claim 3.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kriegel et al. in combination with Luo et al. (US 20050175235 A1).

Regarding Claim 5: (As best understood by the Examiner) Kriegel teaches a method for determining feature data ("Based on the most promising of these three models, we explain how sets of feature vectors can be used for more effective and still efficient similarity search." at abstract) that represents information about the shape of an object, the object being located in a k-dimensional space ("Examples for new applications that require the retrieval of similar 3-D objects include databases for molecular biology, medical imaging and computer aided design." at page 1(587), Section 1. Introduction, left column) the method comprising the steps of:

determining a partitioning scheme that defines a plurality of cells in the space in which the object is located such that at least some of the cells each contain a respective portion of the object (Refer to Figure 1, further at Sections 1.1 Shape Histograms and Section 3.3 Spatial Features; "We divide the data space into axis parallel, equi-sized partitions (cf. Figure 1). This kind of space partitioning is especially suitable for voxelized data, as cells and voxels are of the same shape, i.e. cells can be regarded as coarse voxels.")

and determining the feature data for the object ("After partitioning the data space, we have to determine the spatial features of the objects for each grid cell depending on the chosen model." at page 588, Section 3.3 Spatial Features) on the basis of at least one property of the respective portions of the object that are contained in the plurality of cells (Refer to Figure 4, Section 4, Using Sets of Feature Vectors for Similarity Queries)

Luo teaches the method being characterized in that the partitioning scheme ("In an exemplary embodiment, the initial grid pattern is applied to divide the composite image into sub-images of the same general size and shape." refer to paragraph [0031]) is determined such that at least

some of the boundaries of the cells defined by the partitioning scheme are adapted to the individual shape of the object ("For example, it the original image is a two-dimensional square, the initial grid pattern can be divided into 2.sup.2N squares of equal size by (4N-2) intersecting lines, where N is a positive integer. Similarly, a two-dimensional circular region can be divided into a plurality of equal size wedge-shapes regions via one or more evenly spaced lines drawn through a center point of the circular region." at paragraph [0031]) to delimit a plurality of regions in the space in which the object is located such that the respective portions of the object that are contained in the plurality of regions are approximately equal to each other with respect to a predetermined measurement metric ("In an exemplary embodiment, the selected sub-images are divided as to produce sub-images of the same general shape. For example, if the initial grid pattern separates the image into square sub-images, the grid pattern can be modified such that a selected sub-image is separated into a plurality of smaller squares." at paragraph [0033])

Kriegel and Luo are combinable because they are in the same field of image processing and analysis, feature extraction and classification of feature data.

It would have been obvious to delimit a plurality of regions in the space in which the object is located such that the respective portions of the object are approximately equal to each other as taught by Luo.

Further, it would have also been obvious to determine that at least some of the boundaries of the cells defined by the partitioning scheme are adapted to the individual shape of the object as taught by Luo with the method of determining feature data as taught by Kriegel.

The suggestion/motivation for combining Kriegel and Luo would have been to at least "analyze the feature vectors with respect to an N-dimensional feature space to determine regions of feature space associated with each class." (Luo at paragraph [0056]).

All of the claimed elements were known in the prior art at the time that the invention was made. It would have been obvious to the skilled artisan to be able to combine the teachings of Kriegel and Luo by known methods with no change in their respective functions, and the combination of the teachings would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Therefore, it would have been obvious to combine the teachings of Kriegel and Luo to obtain the specified claimed elements of Claim 5.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is (571)270-1583. The examiner can normally be reached on Monday-Friday 8:00-4:00pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bhavesh M Mehta/
Supervisory Patent Examiner, Art Unit 2624

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